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Moral hazard, firms' internal governance and management earnings forecasts

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Moral Hazard, Firms' Internal Governance and Management Earnings Forecasts

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Abstract
This paper investigates the role of management earnings forecasts in mitigating information asymmetry between investors and managers relating to moral hazard, and explains how earnings guidance facilitates monitoring. I demonstrate that firms that are more susceptible to moral hazard problems and more difficult to monitor are also more likely to issue annual earnings forecasts and they do so more frequently. In addition, I examine how firm internal governance drives forecasting decisions and show that stronger board governance and managerial equity incentives are associated with higher likelihood and frequency of forecast issuance. Finally, I provide robust evidence that managerial equity incentives are associated with more informative and higher quality guidance. In particular, I find that these forecasts are more accurate, unbiased, more specific and timely, consistent with equity incentives aligning shareholders' and managers' interests regarding disclosure decisions. However, I find mixed evidence on the association between board governance and forecast quality.

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1. Introduction

Earnings guidance has become an increasingly common corporate disclosure activity since the mid-1990s. Anilowski, Feng and Skinner (2007) document an increasing proportion of forecasting firms (market value-weighted) from 5% in 1994 to 46.4% in 2003. Hence, the question of whether it is beneficial for firms to provide earnings guidance to the capital markets has attracted substantial practitioner and academic interest. Practitioner literature claims that there are no substantial benefits to providing earnings guidance (Hsieh, Koller and Rajan (2006)) and suggests that these practices may lead managers to fixate excessively on short-term performance and sacrifice long-term firm value (CFA Centre for Financial Market Integrity and Business Roundtable Institute for Corporate Ethics (2006)). Despite recommendations to stop providing earnings guidance, a recent survey in 2008 by the National Investor Relations Institute (NIRI) still finds that 64% of respondent firms provide earnings guidance (NIRI (2008)) presumably because of capital markets demand[1]. The academic literature also contributes to the existing debate. Chen, Matsumoto and Rajgopal (2006) and Houston, Lev and Tucker (2008) investigate quarterly guidance-stoppers and find that a major reason why these firms cease issuing guidance is because of poor stock and operating performance and not because they intend to focus on long-term value creation. The divided opinion and mixed evidence regarding the usefulness of earnings guidance and whether the bold recommendation to cease all guidance is

[1] For example, a recent survey by the CFA Institute finds that analysts and assets managers still prefer some form of annual guidance, with 68% of respondents agreeing that they always or often incorporate annual earnings guidance into their analysis (CFA (2008)).

the appropriate measure to mitigate "short-termism[2]" suggests that earnings guidance is likely to remain a relevant and debatable topic in the foreseeable future.

Against the backdrop of this continuing debate, this paper focuses on the important role of earnings forecasts[3] in reducing information asymmetry relating to moral hazard and how firms' internal governance mechanisms[4] are organized to influence corporate forecasting activities. Based on agency theory, I first propose that one principal role of earnings guidance is to mitigate information asymmetry relating to moral hazard between investors and managers. The inherent conflict between shareholders and managers due to the separation of ownership and control and the agency costs that arise due to shareholders' inability to monitor managerial action perfectly has been well-established in the literature (Berle and Means (1932), Jensen and Meckling (1976), among others). In order to minimize overall agency costs in this relationship, shareholders and managers set up costly mechanisms to protect their self-interests[5]. For example, risk-averse managers are awarded costly equity incentives to align their interest with shareholders' interest even though cash compensation may be cheaper. Financial reports are made more conservative at the expense of losing relevance to mitigate wealth expropriation by managers and shareholders (LaFond and Watts (2008)). Firms also voluntarily provided interim reports, prior to a mandatory requirement, presumably to facilitate monitoring (Leftwich, Watts and Zimmerman (1981)). I

[2] The CFA Centre and Business Roundtable Institute (2006) define "short-termism" as "the excessive focus of some corporate leaders, investors, and analysts on short-term, quarterly earnings and lack of attention to the strategy, fundamentals, and conventional approaches to long-term value creation."

[3] In this paper, the expression "earnings forecasts" and "earnings guidance" are used interchangeably.

[4] Throughout this paper, I follow the broad definition of internal governance to include board of directors and compensation policies (Gillan (2006)). In the paper, I will separately examine board governance and managerial incentives.

[5] Jensen and Meckling (1976) define agency costs as the sum of: 1) principal's monitoring costs; 2) agent's bonding costs and; 3) residual loss.

propose that earnings guidance is yet another costly mechanism that firms voluntarily employ to mitigate moral hazard problems. To test this prediction, I examine the association between firms' likelihood and frequency of annual earnings forecasts and the difficulty of monitoring these firms, and I find that firms that are more susceptible to moral hazard problems-lower insider ownership, larger scope of operation, lower capital intensity, higher growth, higher leverage and greater number of business segments-are more likely to provide earnings forecasts. In addition, firms with higher operating profitability, higher investment intensity and lower geographical and industry sales concentration also provide more frequent forecasts.

Next, I examine how firms' internal governance is structured to influence forecasting decisions. I find that while board governance is influential in advocating the likelihood and frequency of earnings forecasts, they are less effective in ensuring the quality of these forecasts. In particular, boards that are composed of more outside directors are associated with less accurate earnings guidance. As boards play a dual role as both monitor and advisor (Adams and Ferreira (2007)) and the costs of advising are higher for boards with more outsiders (Linck, Netter and Yang (2008)), this result presumably suggests that boards' monitoring benefits are traded-off against the costs of less accurate disclosure. Also, larger boards are associated with less timely earnings guidance, presumably because of the difficulty in coordinating larger boards (Jensen (1993)). On the other hand, equity incentives are consistently associated with higher likelihood and frequency of earnings guidance, as well as forecasts that are more accurate, free-of-bias, more specific and more timely. This evidence suggests that equity incentives play an important role in aligning shareholders' and managers' goals regarding corporate disclosure.

This paper makes several contributions to the voluntary disclosure and corporate governance literature. First, while prior work has identified reducing information asymmetry as a primary

motivation for voluntary forecast issuance, they have not specifically linked moral hazard to that asymmetry. Using agency theory as a framework, I relate moral hazard to information asymmetry and also examine how firms' forecasting activities are endogenously determined in response to environmental and contracting constraints. From this perspective, I abstract from existing debates whether firms currently provide too much or too little guidance: I show that firms choose their disclosure practices in response to capital markets information demand[6].

Second, prior work has not extensively examined how different internal governance mechanisms work together to influence corporate practices. Board governance and equity incentives are perhaps the most important components among firms' internal governance mechanisms[7], and yet most prior work has examined their influence on corporate disclosure individually (Nagar, Nanda and Wysocki (2003), Ajinkya, Bhojraj and Sengupta (2005), Karamanou and Vafeas (2005)). As Core (2001) highlighted in his discussion of Healy and Palepu (2001), firms' corporate governance structure, compensation policies and disclosure practices are likely to be endogenously determined, I posit that firms' choice of governance mechanisms likely considers the effectiveness of each mechanism in minimizing agency costs collectively. By considering firm's environmental, contractual and governance attributes simultaneously as a corporate eco-system, I am able to provide a more comprehensive explanation on how board governance and equity incentives influences disclosure choices. In addition, I demonstrate that firms substitute (complement) equity incentives for board

[6] This reasoning is similar to earlier studies examining equilibrium level of managerial ownership (Demsetz and Lehn (1985), Himmelberg, Hubbard and Palia (1999)) and corporate financing, dividend and compensation policies (Smith and Watts (1992)).

[7] Other components of internal governance include capital structure, bylaw and charter provisions and internal control systems (Gillan (2006)).

governance in inducing earnings forecasts when board governance effectiveness is low (high), presumably to lower overall firm agency costs. This indicates that there is unlikely one-size-fit-all governance structure in influencing corporate practices and suggests that lawmakers' call to regulate corporate governance practices (for example, through the Sarbanes-Oxley Act) is unlikely to be effective, since firms are already tailoring their governance structure in response to agency constraints.

Third, this paper extends our understanding of the role of equity incentives in influencing disclosure choices. Prior work has usually focused on managers' opportunistic choice of disclosure associated with stock-based compensation (Aboody and Kasznik (2000), Cheng and Warfield (2005)). To my knowledge, Nagar, Nanda and Wysocki (2003) is the only prior study that considers the association between equity incentives and disclosure frequency from an efficient contracting perspective. However, as Barth (2003) critiqued, forecast frequency can hardly represent disclosure informativeness and content. Managers exercise substantial discretion over forecast characteristics and hence incentives are likely to matter, so I then provide further evidence that managers with higher equity incentives provide more informative disclosures that are more accurate, free-of-bias, more specific and more timely. Furthermore, the relationship between managerial equity incentives and disclosure practices is not extensively documented in the literature, leading Hirst, Koonce and Venkataraman (2008) to comment in their review of management earnings forecast literature that "managers' choice of forecast characteristics appears to be the least well-understood (both in terms of theory and research) even though it is the component over which managers have the most control". My study extends our understanding of this topic by examining how equity incentives influences a comprehensive set of forecasting choices.

Finally, my study provides a possible reason for the increasing importance of earnings forecasts: their role as a monitoring mechanism. Leftwich, Watts and Zimmerman (1981) conjecture that one possible reason firms before the 1950's voluntarily provide interim reports in the absence of mandatory interim reporting requirements is to reduce agency costs, and they find some empirical evidence to support their prediction. Following their line of reasoning, I conjecture that firms voluntarily provide earnings forecasts as a form of "interim reporting" to facilitate monitoring, and I find consistent evidence that firms with potential moral hazard problems are more likely to issue earnings forecasts. This evidence may help explain the relatively low informativeness of earnings announcements (Ball and Shivakumar (2008)) since "interim reporting" via earnings forecasts is made prior to actual earnings release. Given its monitoring role, my paper also suggests that earnings guidance is likely to remain an important component in corporate disclosure policies despite recommendations to cease this practice.

The remainder of my paper proceeds as follow. In section 2, I review the related literature and develop my hypotheses. In section 3, I explain my research design and justify my choice of empirical proxies. In section 4, I outline the description of my sample and provide formal tests of my hypotheses in section 5. I conduct additional analyses and sensitivity checks in section 6 and conclude in section 7.

2. Related Literature and Hypotheses Development

2.1 The Role of Management Earnings Forecast in Reducing Moral Hazard Problems

There is a large body of literature explaining why firms voluntarily issue earnings forecasts[8]. Firms issue earnings guidance to reduce market uncertainty over future earnings and to correct unrealistic earnings expectations to avoid disappointment at the announcement (Ajinkya and Gift (1984)). This incentive is accentuated for bad news disclosure, presumably to mitigate litigation risks (Skinner (1994, 1997), Field, Lowry and Shu (2005)).[9] Managers also provide forecasts to level the information playing field among market participants by providing equal earnings information access to all participants so as to mitigate adverse selection problems (Ruland, Tung and George (1990)). Consistent with earnings forecasts being value-relevant, Frankel, McNichols and Wilson (1995) document that firms with a long run tendency to access the capital markets are also more likely to issue forecasts, presumably to lower the cost of equity capital. Practitioners' survey evidence also suggests that managers provide earnings guidance to reduce the information gap between the firm and capital markets. In a recent National Investor Relations Institute (NIRI) survey of companies' guidance practices and preferences (NIRI (2008)), 89% of respondents indicated that they provide earnings guidance "to ensure sell-side consensus and market expectations are reasonable" and 44% of respondents indicated that they provide earnings guidance because they think that "the company has better visibility than non-insider.[10]" In sum, managers provide forecasts to reduce information asymmetry between capital markets and firms (Coller and Yohn (1997)), and lower information asymmetry is associated with higher stock

[8] See Hirst, Koonce and Venkataraman (2008) for a review of the management earnings forecast literature.

[9] However, Francis, Philbrick and Schipper (1994) find no evidence that preemptive disclosure deters litigation completely.

[10] McKinsey & Company (Hsieh, Koller and Rajan (2006)) survey provides similar findings: the two most significant benefits of earnings guidance are (1) satisfying requests from investors and analysts, and (2) maintaining a channel of communication with investors. These two benefits presumably lead to lower information asymmetry and closer future outlook consensus between corporate insiders and market participants.

liquidity (Diamond and Verrecchia (1991)) which leads to lower cost of capital (Leuz and Verrecchia (2000)).

Even though prior studies have highlighted reduction of information asymmetry as one of firms' primary motivations for providing earnings forecasts, there is scant evidence suggesting that firms voluntarily issue forecasts as a monitoring mechanism to mitigate moral hazard problems. I refer to moral hazard problems as the information asymmetry between capital markets and managers that exists because markets participants, and shareholders in particular, are not able to fully observe managers' actions. And due to the separation of ownership and control, managers, being self-interested economic agents, are likely to choose actions that first advance their own benefits rather than shareholders' welfare (Berle and Means (1932), Jensen and Meckling (1976)). For example, managers may over-invest for empire building reasons, over-compensate themselves and consume excessive perks, or even shirk, all of which decrease firm value. As a result of this uncertainty over managers' actions and shareholders' inability to observe and monitor these actions completely[11], investors are likely to price-protect themselves by discounting the firm's value or even refuse to invest their capital.

In this paper, I propose that firms can mitigate moral hazard problems and reduce overall firms' agency costs by voluntarily issuing earnings forecasts. Earning guidance offers regular updates on managerial activities and provides information regarding management's expectation of future firm performance. As such, earnings forecasts "bring the future forward" and allow capital markets to evaluate managers' accomplishments not just based on past and current firm

[11] Shareholders are unable and unwilling to monitor managers' action perfectly both because it is not cost effective to do so as well as because dispersion of ownership in large corporations leads to free-rider problems as there is no shareholder willing to solely bear the cost and responsibility of monitoring managers for the common benefits of other shareholders (Jensen and Meckling (1976)).

performance, but also based on expected future firm performance. Consistent with this idea, Lundholm and Myers (2002) find that firm's disclosure activity, as measured by the AIMR ratings of corporate disclosure, is positively associated with the extent to which future earnings information is being impounded in current stock returns.

Earnings guidance also commits managers to their publicly announced earnings targets and provides greater discipline on their actions. Managers likely base their earnings forecasts on internal budgetary and reporting processes. The board of directors may not possess the financial or business expertise to fully comprehend whether internally set budgets are reasonable and hence without external scrutiny of earnings targets, managers may "sandbag" their performance targets or manipulate their preset targets to ensure internal earnings goals are met. With external scrutiny of earnings forecasts, managers have less flexibility to set too conservative earnings targets or manipulate those targets, and they implicitly pre-commit to meet their disclosed earnings guidance[12]. As result, earnings forecasts facilitate monitoring and discipline over managerial activities.

Earnings forecasts may also play an "interim reporting" role in the financial reporting process. Leftwich, Watts and Zimmerman (1981) investigate whether firms before the 1950's voluntarily provided interim reports to reduce agency costs, and they find some evidence that firms that have more debt, which presumably represent firms with greater agency conflicts, also report more frequently. Consistent with this idea, earnings forecasts which report managers'

[12] I assume that there is some reasonable consistency between internal earnings targets and publicly disclosed earnings forecasts so that managers cannot manipulate one without manipulating the other. Given that the board of directors likely provide oversight over the firms' disclosure practices (see next section), it is reasonable to assume reasonably low discrepancy between internal and external earnings targets.

expectation of future performance, can be construed as a form of "interim reporting," since they also provide capital markets with provisional earnings information within the fiscal period. The only difference between interim reporting and earnings forecast setting is the former represents provisional reporting of past performance whereas the latter represents provisional reporting of expected future performance which may be perceived as less credible. However, since earnings forecasts are documented to be credible and capital markets react to these forecasts (Ajinkya and Gift (1984)), I expect earnings forecasts to perform a monitoring role similar to interim reporting.

Finally, the role of earnings guidance in mitigating moral hazard is not limited to alleviating the agency problem between managers and shareholders: it could serve as a monitoring mechanism for the board of directors as well. Even though the board of directors bears a fiduciary duty to shareholders, they have been criticized for being too "friendly" to managers or being controlled by the CEO and hence deemed ineffective monitors of management (Jensen (1993)). Given that boards possess authority over firms' financial reporting process, an effective board may advocate managers to issue public earnings forecasts and subject both the board and the management team to public scrutiny of their performance in order to show their monitoring competence. Hence, earnings forecasts may play a role in mitigating moral hazard problems between boards and shareholders.

Even though earnings forecasts do not possess the same characteristics as mandatory financial accounting information (for example, earnings forecasts are not audited and hence not verifiable at the time of disclosure, and they may not be precise as they may be disclosed as a qualitative, open-ended or range estimate), I propose that they play an incremental, if less

important, role to other more credible sources of accounting information. First, even though earnings forecasts are not audited or verifiable at the time of disclosure, they can be verified for accuracy ex-post at the actual earnings release. Rational managers will not risk their reputation by forecasting carelessly, and Zamora (2009) finds that managers are rewarded for their superior forecasting abilities through career progression and higher compensation. Hence career concerns motivate managers to forecast more accurately, which increases the credibility and informativeness of the earnings guidance. Second, management forecasts are becoming more important as a source of information for the capital markets. Ball and Shivakumar (2008) find that actual announcement of earnings does not provide substantial new information to the market, which presumably highlights alternative sources of more timely information like earnings forecasts[13]. Anilowski, Feng and Skinner (2007) also corroborate this presumption by documenting that management guidance affects market's aggregate stock returns. In sum, I propose that firms provide earnings guidance in order to mitigate moral hazard problems, and since the benefits of providing such disclosure is increasing in the extent of these (potential) problems, I present my first set of hypotheses (in alternate form) as follow:

H1A: The **likelihood** of a firm issuing a management earnings forecast is increasing in its moral hazard problems, *ceteris paribus*.

H1B: The **frequency** of a firm's management earnings forecast issuance is increasing in its moral hazard problems, *ceteris paribus*.

[13] In addition, Ball and Shivakumar (2008) find that management forecasts are associated with approximately 25% of quarterly return volatility.

A competing hypothesis is that moral hazard problems may be so great that managers become too difficult to monitor. Under such circumstances, self-serving managers may either sometimes provide too much guidance because they are fixated on the "earnings guidance game,[14]" or they may other times provide too little or even no guidance because they want to hide their sub-optimal actions like shirking and excessive consumption of perks. Either way, this alternative hypothesis will predict an average no association between the likelihood and frequency of earnings forecasts and moral hazard problems.

2.2 Board Governance, Equity Incentives and Management Earnings Forecasts Characteristics.

Based on the discussion in the preceding section, firms appear to benefit from greater financial transparency by providing earnings guidance. However, managers may not want to provide earnings forecasts because they incur personal costs from such disclosure. For example, managers may be uncertain about how investors will interpret and respond to their guidance (Nagar (1999), Suijs (2007)), or because managers derive entrenchment benefits from non-disclosure (Shleifer and Vishny (1989)). The cost of information collection and dissemination for management earnings forecasts is also non-trivial: a McKinsey survey (Hsieh, Koller and Rajan (2006)) indicates that respondents cite management time as the highest cost of providing forecasts. Also, mandating that managers provide informative earnings forecast is not easily enforceable or contractible as investors may be uncertain whether managers possess information (Dye (1985)). Given this disclosure goal incongruence between shareholders and managers, there are two mechanisms through which firms can encourage managers to provide earnings forecasts.

[14] Fuller and Jensen (2002) calls earnings guidance a "game" between CEOs and Wall Street which leads managers to sacrifice firm value and engage in aggressive earnings management to meet their own earnings guidance.

First, firms can impose direct monitoring over managerial disclosure activity through board governance (Ajinkya, Bhojraj and Sengupta (2005), Karamanou and Vafeas (2005)). As Fama and Jensen (1983) highlight, the board of directors represents the "apex of the decision control systems" of the organization, and since board directors bear a primary fiduciary duty to shareholders, they can represent shareholders' interest by providing direct oversight over management activities, which includes their disclosure decisions[15]. For example, a more involved and vigilant board is more likely to recognize shareholders' need for earnings guidance and therefore mandate more frequent and timely earnings forecasts when such information becomes available. Also, a more independent board is less likely to be "captured" by management and hence more likely to act in shareholders' interest. Given that boards of directors have the authority over firms' internal control systems and the power to reward good forecasting practices (Zamora (2009)), I propose that board governance positively influences not only the likelihood and frequency of earnings forecasts, but also the quality and characteristics of such disclosure. My second set of hypotheses (in alternate form) is presented as follow:

H2A: The **likelihood** of a firm issuing a management earnings forecast is increasing in the strength of its board governance structure, *ceteris paribus*.

H2B: The **frequency** of a firm's management earnings forecast issuance is increasing in the strength of its board governance structure, *ceteris paribus*.

[15] This is not to say that earnings forecasting activities is redundant when an effective board governance is in place or that earnings forecasts and board governance are substitutes in mitigating moral hazard problem. One could imagine that forecasting activities is still necessary for monitoring purposes since market participants may possess information incremental to the board's which is useful for disciplining managers. For example, the board of directors may not possess the expertise to know whether a particular project selection is bad; however, capital markets may be better able to assess the appropriateness of the investment for monitoring and disciplinary purposes.

H2C: The **quality of a firm's management earnings forecast** is increasing in the strength of its board governance structure, *ceteris paribus*.

A competing hypothesis regarding H2C is that strength of board governance may be negatively associated with the quality of firms' management earnings forecast because a strong, independent and outsider-dominated board may be competent in monitoring management but not possess the financial and business expertise to influence the quality of the firm's disclosure. Adams and Ferreira's (2007) board structure model proposes that the board serves a dual role as a monitor and advisor, and these two roles may not be complementary with each other and may even conflict. Linck, Netter and Yang (2008) also predict and find that the costs of advising are lower for insider-dominated boards. Hence this suggests that a weak governance structure that consists of mostly insiders who are more familiar with the firm's business may influence higher quality earnings forecasts, which is opposite to my prediction.

Second, firms can motivate managers to provide earnings forecast through better incentive alignment using equity incentives[16]. By awarding equity incentives, managers' wealth is tied to firm value and hence managers are more willing to provide earnings guidance to reduce information asymmetry and increase firm value. Note that managers may still voluntarily provide earnings guidance without equity incentives if they are fixated on the "earnings guidance game,"

[16] Nagar, Nanda and Wysocki (2003) also conjecture that with stock-based compensation, managers are more likely to disclose their private information since good news are stock price increasing and by disclosing good news, managers are obliged to disclose bad news because market participants know that they possess information, and they find supporting empirical evidence that managers with more stock-based compensation are more likely to forecast more frequently. Even though we are similar in examining the relationship between stock-based incentives and forecast frequency, our explanations differs. My hypothesis is built specifically on the importance of providing timely earnings forecasts ("bringing the future forward") to facilitate monitoring of management, and their hypothesis is built on disclosure of private information (not necessarily earnings information), which they use earnings forecast as a proxy. Furthermore, they do not examine the relationship between equity incentives and forecast characteristics, which I discuss next.

but I propose that equity incentives are able to motivate managers to choose the disclosure decision that increases long-run firm value. The CFA Centre for Financial Market Integrity and the Business Roundtable Institute for Corporate Ethics (2006) also suggests that executives be awarded compensation that is tied to long-term corporate value creation to mitigate managers' fixation on "short-termism."

I further predict that because managers have wide discretion over the characteristics of the forecasts and their informativeness, equity incentives help managers overcome their private costs of disclosure and result in a higher forecast quality. That is, the manager is more willing to incur "bonding costs" to reduce overall firm agency costs since he participates in the firm's long-term success. For example, a manager may not be willing to invest the time and effort to provide a highly accurate earnings forecast. However with equity incentives, the diligence and care that he is willing to devote on forecasting activities is increasing in his stock-based compensation. The implicit assumption here is that information asymmetry is decreasing in forecast quality and hence managers' compensation which is tied to equity increases as information asymmetry decreases.

Given the preceding discussion, my third set of hypotheses (in alternate form) is as follow[17]:

H3A: The **likelihood** of a firm issuing a management earnings forecast is increasing in the strength of its managerial equity incentives, *ceteris paribus*.

[17] I do not assert that equity compensation is the *only* incentive driving managers' disclosure decision. For example, managers may be rewarded bonuses for forecast effectiveness (Zamora (2009)), and to the extent that this other incentive correlate with the outcome (likelihood of forecast) and the variable of interest (equity incentives), there is an omitted correlated variable problem. However, I reason that a strong board governance must be in place for the internal performance evaluation system to be effective in order to reward/punish forecasting performance, hence to the extent that board governance control for this other incentive, the omitted correlated problem is mitigated in my empirical model.

H3B: The **frequency** of a firm's management earnings forecast issuance is increasing in the strength of its managerial equity incentives, *ceteris paribus*.

H3C: The **quality of a firm's management earnings forecast** is increasing in the strength of its managerial equity incentives, *ceteris paribus*.

A competing (and not mutually exclusive) hypothesis is that equity incentives lead to greater managerial opportunism. Aboody and Kasznik (2000) and Cheng and Warfield (2005) find that managers with higher equity incentives time their voluntary disclosure and manage earnings to increase option grant value and insider trading profitability respectively. To the extent that such opportunistic behavior decreases disclosure quality (for example, earnings quality is decreasing in earnings management), equity incentives are negatively associated with forecast quality.

One final comment before we move to the next section. It is not clear from the preceding discussion that stronger board governance and equity incentives will necessarily lead to more earnings forecasts. It could be the case that strong board governance and equity incentives will lead to *fewer or even no* earnings forecast. For example, it may not be value-increasing for firms with high proprietary costs of disclosure to provide earnings forecasts since that information can be used to the firm's disadvantage by its competitors. However in my empirical model, I include proxies for proprietary costs of disclosure and industry fixed-effects to control for situations where earnings forecasts may be value-decreasing. Furthermore if it were the case that forecasts are value-decreasing, I should find no empirical support for my hypotheses.

3. Research Design and Variable Definition

3.1 Research Design

For my test of H1A/B, H2A/B and H3A/B, I regress the probability of forecast issuance (FORECAST) or the frequency of forecasts (FC_FREQ) over the fiscal year on its lagged determinants:

$$\Pr(FORECAST_{t+1}) = \alpha_0 + \beta_i(\text{Equity Incentives})_t + \sum\varphi_i(\text{Board Governance})_t + \sum\gamma_i(\text{Moral Hazard})_t + \sum\phi_i(\text{Controls})_t + \varepsilon_t$$

$$FC\_FREQ_{t+1} = \alpha_0 + \beta_i(\text{Equity Incentives})_t + \sum\varphi_i(\text{Board Governance})_t + \sum\gamma_i(\text{Moral Hazard})_t + \sum\phi_i(\text{Controls})_t + \varepsilon_t$$

For the empirical model explaining probability of forecast issuance, I use a probit model and for the empirical model explaining frequency of forecast, I use standard ordinary least squares (OLS) model. I also include both Fama-French (1997) forty-eight industry classifications and year indicator variables to control for industry and year fixed-effects. Finally, since this is a pooled sample, I adjust the standard errors to control for cross-sectional and time-series dependence (Petersen (2008), Gow, Ormazabal and Taylor (2009)).

For test of H2C and H3C explaining the influence of board governance and equity incentives on forecast quality, I need to first define characteristics associated with a high quality earnings forecast. Given that my hypotheses are built on the monitoring role of earnings forecasts, I expect high quality forecasts to possess similar qualitative characteristics as decision-useful financial reporting information as outlined in FASB Conceptual Framework[18] (FASB, 2008).

[18] The qualitative characteristics discussed in the Conceptual Framework include relevance, faithful representation, comparability and understandability. Relevance of information refers to the predictive and confirmatory value of that information in helping users form expectations regarding the firm's future cash flows, as well as the timeliness in the presentation of such information. Faithful representation of information refers to information that is verifiable, neutral and complete. Information comparability refers to the qualitative characteristic of information that allows users to make meaningful comparison between two sets of economic phenomena and finally, understandability of information ensures that disclosure is presented in a way that is comprehensible to reasonably sophisticated users.

Hence, I characterize a high quality earnings forecast to be: 1) more accurate and hence being more informative and having predictive value; 2) neutral and free of bias; 3) more specific and hence more easily comprehensible and verifiable for accuracy and; 4) more timely.

I then regress various characteristics of earnings forecasts made over the fiscal year on its lagged determinants using OLS:

$$FC\_QUAL_{t+1} = \alpha_0 + \beta_i(\text{Equity Incentives})_t + \sum\varphi_i(\text{Board Governance})_t + \sum\gamma_i(\text{Moral Hazard})_t + \sum\phi_i(\text{Controls})_t + \varepsilon_t$$

where forecast quality (FC_QUAL) refers to the forecast accuracy (FC_ACC), bias (FC_BIAS), specificity (FC_SPEC) and horizon (FC_HORIZ) of the management earnings guidance (see Appendix A for full description of these variables). Similar to the earlier empirical models, I control for industry and year fixed-effects and cross-sectional and time-series clustering. In the following sub-sections, I explain my choice of empirical proxies in greater detail.

3.2 Measure of Moral Hazard

There is currently no comprehensive and universal empirical proxy for moral hazard. Most prior studies use measures that represent situations where potential moral hazard problems are more likely, for example settings where owners' and managers' objectives are more likely to diverge (that is, where there is a separation of ownership and control) and environments where monitoring managers' effort and actions are difficult. Based on prior studies, I use three comprehensive sets of proxies to measure moral hazard, which I discuss next[19].

[19] I do not attempt to use variable reduction procedure like principal component analysis to reduce the number of variables as the identified components may not lend themselves to straightforward interpretation.

3.2.1 Insider Ownership

My first set of moral hazard measures has only one element, insider ownership (INSIDEOWN), which is determined based on the percentage shareholdings held by the top five executives in the firm. Since agency problems arise from the separation of ownership and control and moral hazard problem is absent where the owner is also the manager, I propose that firms with lower insider ownership are more susceptible to moral hazard problems.

3.2.2 Moral Hazard Proxies according to Himmelberg, Hubbard and Palia (1999)

Himmelberg, Hubbard and Palia (1999) examine the determinants of managerial ownership and identify several observable firm variables that represent monitoring difficulty and scope for moral hazard problem in the firm. Their study extends and builds on Demsetz and Lehn (1985)'s seminal paper which recognizes that managerial ownership is endogenously determined by the firm's contracting environment. Following Himmelberg, Hubbard and Palia (1999), I identify firm size (LN(SALES)), capital intensity (PPE), idiosyncratic risk (IRISK), operating profit margin (OM), research and development intensity (R&D), advertising intensity (ADVERT) and investment intensity (INVEST) as my empirical proxies for moral hazard.

We expect that monitoring is more difficult for larger firms (LN(SALES)) due to their greater scope of operations. On the other hand, we expect firms with greater proportion of assets in "hard assets" (PPE) are easier to monitor because they are more tangible and can serve as collateral in debt contracts. Monitoring is expected to be more difficult for firms with higher idiosyncratic risk (IRISK) since this indicates the volatility of the firm's operating environment. Operating profit margin (OM) represents the firm's market power and free cash flow, and since the scope for agency problems is higher for firms with high free cash flows (Jensen (1986)),

monitoring is expected to be more difficult for these firms. Research and development (R&D), advertising (ADVERT) and investment intensity (INVEST) represents discretionary spending, and hence we expect monitoring to be more difficult for firms with high discretionary spending, especially where the economic outcome of such expenditure is not easily measurable. However, since research and development expenses and advertising expenses can also represent proprietary costs of disclosure[20], I do not make a prediction on the hypothesized directions for these two variables. Following Himmelberg, Hubbard and Palia (1999), I include square-terms for LN(SALES) and PPE to allow for non-linearity in the relationship, and I also include indicator variables for firms with missing observations on R&D, ADVERT and INVEST and set these variables to zero where they are missing.

Finally, I include the book-to-market ratio and long-term debt ratio as two additional proxies for moral hazard, and I expect firms with lower book-to-market ratios and higher leverage ratios to represent higher moral hazard problems, since low book-to-market indicates growth firms which are difficult to monitor, and leverage represents the agency cost of debt.

3.2.3 Organizational Complexity

The final set of proxies for moral hazard represents organizational complexity and consist of percentage of foreign sales (FORSALE), natural logarithm of the number of business segments (LN(SEG)) and firm's geographical and industry sales concentration (GEO_HERF and IND_HERF respectively).

[20] For example, Wang (2007) uses research and development expenses as an empirical proxy for proprietary information costs.

Following Bushman, Chen, Engel and Smith (2004), I conjecture that firms operating in multiple industries and/or geographical locations are more difficult to monitor because of their complexity and wide scope of operations. Managers may hide inefficiencies and poor results by aggregating performance across divisions or transferring resources between segments. Furthermore, segment reporting requirements under US generally accepted accounting principles (GAAP) are unlikely to mitigate this complexity because managers are given wide discretion over the choice of segment aggregation and internal cost allocation, and segment performance disclosure are not required to conform to GAAP. Finally, Hope and Thomas (2008) find that managers of firms with a higher proportion of foreign sales growth and lower foreign profit margin are less likely to voluntarily disclose geographical segment earnings information in the post-SFAS131 period, presumably to hide empire building activities[21]. This suggests that firms with a higher proportion of foreign sales are more difficult to monitor and more susceptible to agency problem. In sum, I expect moral hazard problems to be increasing in FORSALE, LN(SEG) and decreasing in GEO_HERF and IND_HERF. Since Compustat segment database does not provide coverage for all firms, I use modified zero-order regression by including indicator variables for missing data on these four variables and set them to zero where they are missing (Greene (2003)).

3.3 Measure of Board Governance

There are various widely used measures of board governance, two of which are board independence (BD_IND) and board size (BD_SIZE). I choose these two popular measures for

[21] However, firms are still required by SEC Regulation section 210.4-08(h) to disclose foreign pre-tax income and foreign tax expense, hence even though managers are not required to disclose results of foreign operations by geographical segments, they are still obliged to provide aggregate information pertaining to their foreign operations.

two reasons. First, there is a well-developed body of literature in corporate finance supporting the use of these two measures as representing governance strength, and recent developments have even considered how these two board characteristics arises endogenously[22], leading to greater understanding of and confidence in the underlying construct of these two measures. Also, there is no straightforward way to aggregate governance variables and interpret their principle components precisely, and data on many governance variables may not be available for many firms (for example, G-index (Gompers, Ishii and Metrick (2003))). Hence, I rely on these two measures to represent governance strength in my main tests[23].

In addition, I include board meeting frequency (NUMMTGS) as another indicator of governance strength as the number of board meetings is likely to represent monitoring intensity and board vigilance over management activities (Vafeas (1999)).

3.4 Measure of Equity Incentives

I measure the strength of managers' equity incentives following Core and Guay (1999, 2002), which estimate the sensitivity of the dollar value of CEO's equity portfolio (or his wealth) to a 1% change in stock price (EQ_INCENT). I choose this measure as opposed to using the composition of stock-based compensation in total compensation, as the latter measure is noisy and subject to year-to-year variations when the board of directors rebalances executives' optimal

[22] For recent theoretical explanations for board independence and size, see Raheja (2005) and Harris and Raviv (2008). For empirical references, see Boone, Field, Karpoff and Raheja (2007), Coles, Daniel and Naveen (2008) and Linck, Netter and Yang (2008).

[23] The use of board size to represent monitoring intensity is not without controversy. Jensen (1993) and Yermack (1996) reason that large boards are more susceptible to communication and coordination problems and free-riding problems, leading to ineffective boards. On the other hand, large boards likely indicate additions of new directors with more diversed skill sets to the existing board, leading to greater expertise in advisory and monitoring (Boone, Field, Karpoff and Raheja (2007), Coles, Daniel and Naveen (2008) and Linck, Netter and Yang (2008)).

equity incentives (Core and Guay (1999)). Also, since my underlying hypotheses consider how equity incentives align managers' incentives with shareholders, it is imperative to choose an incentive measure that considers how the manager is directly better off from choosing actions (in this case, forecasting activities) that increase firm value. By examining the change in manager's dollar wealth from his equity portfolio to a percentage change in firm value, it provides a cleaner measure of managers' direct incentives to increase firm value. Using this measure, I also implicitly assume that the equity portfolio held by the CEO in each year represents the "optimal" level of equity incentives that the board of directors established.

3.5 Control Variables

Finally, I include several control variables in my regression. First, firms are more likely to issue an earnings forecast where information asymmetry among investors is high. Hence, I control for the level of the ex-ante adverse selection problem (ADJINSTM) following Ali, Klasa and Li (2008). Second, investors' demand for information is likely to vary according to institutional ownership dispersion. High institutional ownership concentration (IOCONCENT) may represent lower information demand, since individual large stakeholders have both the incentives and ability to monitor managers directly through direct communications with management.

Third, litigation concerns are likely to affect firms' decisions to issue earnings forecast, and hence I include an indicator variable (LITIG) for firms in high litigation risk industries according to Francis, Philbrick and Schipper (1994). Volatile earnings are also likely to hamper managers' ability to issue forecasts while increasing financial analysts' demand for guidance, so I control for earnings volatility (EARNVOL). Firm performance is likely to affect the propensity to issue

earnings guidance (Miller (2002)), so I control for stock performance (ANNRET) and for firms reporting losses (LOSS). Finally, I control for analyst following (NUMEST) as analysts represent an important group of earnings forecasts users, and their demand for management guidance is likely to increase in the number of them.

3.6 Endogeneity Issues

In Core (2001)'s discussion of Healy and Palepu (2001)'s review of the empirical corporate disclosure literature, he suggests that corporate governance structure, managerial incentive compensation and disclosure practices are likely to be endogenously determined. Other studies also suggest that corporate policies, ownership and governance structure are jointly determined and depend on firm complexity, the investment opportunity set and agency problems (Smith and Watts (1992), Bushman, Chen, Engel and Smith (2004), Dey (2008)). Hence given my empirical model, it implies that both board governance and equity incentives measures are choice variables and likely to be endogenous, and therefore the coefficient estimate is biased and inconsistent. One potential solution to deriving consistent and unbiased estimates is the use of instrumental variable (IV) estimators. However as Larcker and Rusticus (2008) point out, it is not trivial to find a good instrument, and weak and/or semi-endogenous instruments can possibly lead to greater bias as compared to the OLS estimator. Furthermore, IV estimation is less efficient and leads to greater standard errors. Hence my approach to this problem is to use standard OLS and probit models and include possibly omitted correlated variables related to board governance and equity incentives.

The determinants of board governance and equity incentives have been well-researched and developed[24], and most studies agree that the investment opportunity set is a primary driver of board and incentives structures. The corporate finance literature, beginning from Demsetz and Lehn (1985) and later further developed by Himmelberg, Hubbard and Palia (1999), have identified a set of variables presumed to represent firms' investment opportunity set[25]. Since I already included this set of variables as my measure for moral hazard, I believe I have mitigated the omitted correlated variables problem in my empirical model.

4. Data and Descriptive Statistics

My initial sample of firms is obtained from Compustat ExecuComp from fiscal years 1995-2005 where I obtain executive compensation data. I exclude fiscal years before 1995 because FirstCall Company Issued Guidance (CIG) database is not comprehensive before that date, and I exclude fiscal years after 2005 because of the change in accounting rules concerning executive stock options expensing (SFAS123R) may impact firms' managerial equity incentives structure. I obtain management and analysts' earnings forecasts data from FirstCall database, board governance data from RiskMetrics database, institutional ownership data from Thomson Reuters Institutional (13f) holdings database and accounting and stock returns data from Compustat and CRSP database respectively. The initial sample consists of 12,756 firm years and 2,125 unique

[24] For determinants of board structure, see Boone, Field, Karpoff and Raheja (2007), Coles, Daniel and Naveen (2008) and Linck, Netter and Yang (2008). For determinants of equity incentives, see Core and Guay (1999) and Core, Holthausen and Larcker (1999).

[25] In the accounting literature, LaFond and Roychowdhury (2008) have also recently used Himmelberg, Hubbard and Palia (1999)'s determinants of managerial ownership as their proxy for firms' investment opportunity set.

firms, of which 5,214 (7,542) are firm-years with (without) an annual earnings forecast. As observed from Table 1 Panel A, the percentage of forecasting firms increases from 12.8% in 1995 to 53.7% in 2005, consistent with the upward trend documented in Anilowski, Feng and Skinner (2007) from 1994-2003. The average number of forecasts issued for each fiscal year also exhibits an increasing trend. For firms that do issue forecasts, the average number of annual forecasts issued increases from 1.20 in 1995 to 4.65 in 2005.

Table 1 Panel B provides a breakdown of the sample by seventeen main industries[26]. As observed from this panel, there appears to be variation in forecasting activities across industries. 58.0% of firms in the Drugs, Soap, Perfumes and Tobacco industry are forecasting firms whereas only 14.5% of firms in the Oil and Petroleum Products industry are forecasting firms. The heterogeneous variation in forecasting activities across years and industries justify the use of industry and time fixed-effects in my regression models.

Table 1 Panel C provides the descriptive statistics of the variables utilized in the regressions. For FC_ACC, FC_BIAS and FC_SPEC, variables are trimmed at 5% of stock price as these values are extreme[27]. As observed from the table, the mean forecast accuracy, bias and specificity are never greater than 0.57% of stock price, and the first quartile is never greater than 0.68% of stock price. The mean FC_BIAS of 0.0007 indicates that management earnings forecast are unconditionally optimistic on average.

The mean equity incentives is 12.46, which indicates that managerial wealth changes by $256,571 (=exp(12.46)) for every 1% change in stock price. This represents significant personal

[26] The definition of the seventeen industries can be obtained from Kenneth French's website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

[27] Results are not sensitive to trimming at 10% of stock price.

wealth tied to firm value for an average CEO. The average board of directors comprises of 66% outsiders, 9.64 directors and meets 7.29 times annually. Due to database coverage of ExecuComp which covers the S&P 1500 firms, the average firm in my sample is relatively large and has an annual mean revenue of $1,525m (=exp(7.33)) and median revenue of $1,353m (=exp(7.21)) whereas the average firm in the Compustat universe in the same time period has an annual mean (median) revenue of $1,660m ($88m) (untabulated). The firms in my sample are likely to be well-established and stable firms, with mean (median) net property, plant and equipment of 45% (22%) of total assets, whereas the Compustat universe's mean (median) PPE ratio is 23% (16%). Firms in my sample also exhibit better performance and lower earnings volatility, with a mean 16% of firms reporting losses and mean earnings volatility of 0.04 whereas for the Compustat universe, a mean 40% of firms report losses and mean earnings volatility is 0.13. Finally, the average number of analysts following each firm is also relatively high at 8.71, as compared to FirstCall's average of 4.57.

Table 2 provides the Pearson correlation among the main variables of interest for the full sample. As observed from columns 1 and 2, most of the correlation between the forecast variables (FORECAST and FC_FREQ) and the variables of interest are statistically significant in the hypothesized direction, except for IRISK, R&D and INVEST. Also, FORSALE is not significantly correlated with the forecast variables. The correlation among the variables of interest is mostly below 0.4, except between LN(SALES) and BD_SIZE, and between OM and PPE, which suggests that multi-collinearity problem is unlikely to materially affect my empirical analyses.

5. Results

5.1 Forecast Likelihood and Frequency of Forecast Issuance

Table 3 presents the determinants of the likelihood of providing annual earnings forecast and the frequency of annual earnings forecasts. In the FORECAST regression, consistent with H1A, firms more susceptible to moral hazard problems are more likely to issue earnings forecast(s). In particular, firms with lower insider ownership (INSIDEOWN), larger scope of operation (LN(SALES)), lower capital intensity or "hard assets" (PPE), higher growth (BM), higher leverage (LEVERAGE) and higher number of business segments (LN(SEG)) are more likely to provide guidance, presumably to facilitate monitoring by the capital markets and mitigate moral hazard problems. Considering the frequency of forecast issuance (FC_FREQ regression), given that it can be reasonably expected for firms to first decide whether to provide a forecast and then decide how frequently to forecast, I mitigate potential sample selection bias by tabulating results for both OLS and OLS corrected for selection using Heckman two-step procedure.

As observed from the FC_FREQ regression corrected for selection, the inverse Mill's ratio (MILL'S RATIO) is highly significant, indicating potential sample selection problem. Hence for brevity, I will discuss only the result of the model corrected for selection. As seen from the table, the result for moral hazard variables are mostly stronger, in support of H1B. In addition to the other significant variables documented in the FORECAST regression, firms with higher operating profitability (OM), higher investment intensity (INVEST), lower geographical sales concentration (GEO_HERF) and lower industry sales concentration (IND_HERF) provide more frequent forecasts. However, research and development (R&D) loads negatively and advertising intensity (ADVERT) does not load in both regressions, presumably because they represent

proprietary costs of disclosure, which predicts the opposite association with forecast likelihood and frequency. Also, idiosyncratic risk (IRISK) does not load because the firms in my sample are generally larger and more successful and hence exhibit little variation in idiosyncratic risk in the cross-section. Finally, percentage of foreign sales (FORSALE) exhibits a negative and significant coefficient in the FC_FREQ regression which is opposite to my prediction. I posit that managers provide earnings guidance also in consideration of their own visibility of future earnings. Since firms with high percentage of foreign sales are subjected to more uncontrollable factors that might impact earnings (such as currency fluctuations and socio-economic factors in foreign countries), managers provide fewer forecasts as future earnings are less visible and less predictable. Overall, the result suggests that managers and board of directors are more willing to engage in forecasting activities and subject their performance to public scrutiny when the demand for public monitoring is higher and where firms' operations are "less visible" and more prone to moral hazard problems.

Turning to examining firms' internal governance influencing disclosure decisions, consistent with H2A and H3A, firms with stronger board governance represented by larger board size (BD_SIZE) and more frequent board meetings (NUMMTGS) as well as stronger managerial equity incentives (EQ_INCENT) are also more likely to issue earnings forecasts. Also consistent with H2B and H3B, firms with stronger board governance and equity incentives provide forecasts more frequently. The significantly positive coefficient on BD_SIZE refutes claims that larger boards are less effective in monitoring management. However, board independence (BD_IND) does not load in both regressions, possibly because outsider-dominated boards may be more conservative and more concerned about litigation risks and career penalties associated with providing (possibly) inaccurate forecasts and hence less reluctant to influence forecasting

decisions. Srinivasan (2005) documents that outside directors suffer severe career penalties when firms restate their earnings, indicating that outside directors are being held accountable for firms' financial reporting practices and thus leading to their reluctance to influence forecast provision. Overall, the result in this table suggests that boards that comprise of more directors and meet more frequently are more vigilant and more involved in influencing corporate disclosure practices. The significantly positive coefficient on EQ_INCENT in both regressions also suggests that managers with greater equity incentives are more aligned with shareholders with regard to forecasting decisions. In terms of economic significance, increasing BD_SIZE, NUMMTGS and EQ_INCENT from the 10^{th} percentile to the 90^{th} percentile increase the probability of forecast issuance by 4.8%, 3.0% and 2.7% respectively, and these effects are relatively large given that the unconditional probability of forecast issuance is 40.9%. Increasing NUMMTGS and EQ_INCENT from the 10^{th} percentile to the 90^{th} percentile also increase the mean number of forecasts (3.39) by 8.6% and 6.8% respectively.

With regard to the control variables, the result is largely consistent with prior literature. Firms susceptible to greater adverse selection problems (ADJINSTM), lower institutional ownership concentration (IOCONCENT), lower litigation risk (LITIG), lower earnings volatility (EARNVOL), better performance (ANNRET and LOSS) and greater analyst coverage (NUMEST) are more likely to issue earnings guidance and/or issue them more frequently.

Finally, given that managers' equity portfolio value is increasing in good news disclosure and decreasing in bad news disclosure, I investigate if equity incentives only positively influence good news disclosure but *negatively* influence bad news disclosure. I classify each earnings forecast according to the 3-day cumulative abnormal returns (CAR) surrounding the forecast announcement, and forecasts that induce a positive (negative) 3-day CAR are classified as good

(bad) news forecasts. I separately re-run the FC_FREQ regression according to the number of good (bad) news forecast issued in a given fiscal year using Heckman two-step procedure, and the results are tabulated in Table 4.

As observed from Table 4, EQ_INCENT is significantly positive associated with the number of good news (GDNEWS_FREQ) but not associated with the number of bad news (BDNEWS_FREQ) forecasts, suggesting that managers with higher equity incentives releases more good news forecasts and no evidence that these managers withhold bad news forecasts. Comparing the two regressions, NUMMTGS is significantly positive associated with both good and bad news forecasts, supporting the notion that higher board vigilance as signified by more frequent board meetings ensures both good and bad news forecasts are released.

In sum, the results in Table 3 and 4 are largely consistent with my hypotheses. Earnings forecasts are issued in circumstances where they are more useful as a monitoring mechanism to mitigate moral hazard problems. In addition, internal firm governance such as board governance and equity incentives are effective in influencing the disclosure of earnings forecasts in response to investors' information demand. In the following sub-section, I investigate how internal governance influences forecast quality.

5.2 Forecast Quality

In this section, I test hypotheses H2C and H3C that predict a positive association between firms' internal governance and forecast quality. I do not provide formal hypothesis regarding the association between moral hazard problems and forecast quality as it is not obvious *a priori* how moral hazard problems impact forecast quality. On one hand, moral hazard problems indicate investors' demand for earnings guidance and hence forecast quality should be higher to meet capital markets' information demand. On the other hand, moral hazard problems may also

represent forecasting difficulty for managers as well since firms that are more difficult to monitor are more likely to operate in complex and more volatile environments. Hence I do not provide prediction regarding these variables, but I include them in my regression as controls. In addition, I include forecast horizon (FC_HORIZ) and forecast specificity (FC_SPEC) as control variables where they are not the explained variable, and I include forecast news (FC_MEAN or CAR) as a control since the direction and magnitude of the forecast innovation may impact forecast quality.

Table 5 examines the determinants of forecast accuracy and forecast bias. Consistent with H3C, Equity incentives (EQ_INCENT) is significantly positive associated with forecast accuracy (FC_ACC). That is, managers with more equity incentives are more willing to devote the time and effort to provide more accurate earnings guidance. The impact is economically significant as well: considering the mean forecast accuracy of -0.0057, an increase in equity incentives from the 10^{th} percentile to the 90^{th} percentile increases forecast accuracy by 21.1%. Both BD_SIZE and NUMMTGS are positively associated with forecast accuracy, although only NUMMTGS is weakly significant. Surprisingly, BD_IND is significantly *negative* associated with forecast accuracy, which is opposite to my prediction. This result is consistent with Adams and Ferreira (2007)'s model that boards perform a dual role as both monitor and advisor, and Linck, Netter and Yang (2008)'s finding that cost of advising is higher for outsider-dominated boards. The result indicates that boards that consist of more outside directors may not possess the technical expertise to ensure the accuracy of management earnings forecasts, and the impact is economically significant where changing BD_IND from the 10^{th} percentile to the 90^{th} percentile decreases forecast accuracy by 15.6%. The result on the moral hazard variables (LN(SALES), IRISK, LEVERAGE) indicate that firms that are difficult to monitor are associated with *lower* forecast accuracy, suggesting that managers may also find forecasting challenging in such

environment. However, the negative coefficients on INSIDEOWN, BM and GEO_HERF suggests that firms susceptible to moral hazard problems may also provide *more* accurate forecasts in response to capital markets demand.

Turning to examine forecast bias (FC_BIAS), BD_SIZE, NUMMTGS and EQ_INCENT (BD_IND) are positively (negatively) associated with forecast optimism although none of the variables are statistically significant. This result suggests that stronger internal governance is associated with higher quality earnings guidance that is neutral and free-of-bias.

Table 6 investigates the determinants of forecast specificity and forecast horizon. Among the range and point forecasts, equity incentives are significantly positive associated with more specific earnings guidance. As forecast precision is likely to reflect managers' uncertainty regarding future earnings (Baginski and Hassell (1997)), this suggests that managers with higher equity incentives are more confident of their guidance, presumably because they have been more careful and thorough with their forecasting activity. Similar to the earlier forecast qualities examined, none of the board governance variables load significantly. The moral hazard variables (IRISK, R&D, INVEST and LEVERAGE) also suggest that firms that are more difficult to monitor also find it more difficult to provide a precise earnings guidance.

Finally in the FC_HORIZ regression, consistent with H3C, equity incentives (EQ_INCENT) are significantly positive associated with forecast horizon. However inconsistent with H2C, board size (BD_SIZE) is significantly *negative* associated with forecast horizon. One possible explanation for the seemingly contradictory finding is that larger boards are more difficult to coordinate and less nimble in influencing the timeliness of forecast provision. The significant moral hazard variables (IRISK, OM, LEVERAGE and GEO_HERF) suggest that earnings guidance has a longer forecast horizon and hence more timely when firms are difficult to

monitor, presumably in response to investors' information demand. On the other hand, firms with high advertising intensity (ADVERT) are associated with a shorter forecast horizon, presumably because of proprietary costs of disclosure that inhibit timely guidance announcement.

Overall, the result in this section paint a consistent picture supporting the hypothesis that managers with higher equity incentives are more aligned with shareholders' interests regarding disclosure decisions and thus resulting in higher quality earnings guidance that are more accurate, unbiased, more specific and more timely. On the other hand, while board governance influences the likelihood and frequency of earnings forecasts, distinct board characteristics appear to influence forecast quality differentially. In particular, board meeting frequency is associated with more accurate forecasts but more outsiders on the board are associated with less accurate forecasts, presumably due to their lack of expertise in firms' internal operations that drive forecasting activities. Also, larger boards are associated with less timely forecasts as more directors are difficult to coordinate and less nimble in responding to forecasting demand.

6. Additional Analyses and Sensitivity Checks

6.1 Interaction among Internal Governance Mechanisms

Firms are likely to trade-off the cost and benefits of direct monitoring and equity incentives in consideration of firm complexity, the investment opportunity set and agency problems (Smith and Watts (1992), Bushman, Chen, Engel and Smith (2004), Dey (2008)). If direct monitoring is costly due to difficulty in observing managerial actions, firms are likely to substitute equity incentives for direct monitoring mechanism in influencing managerial forecast disclosure, which

suggests a substitutive relationship between board governance and equity incentives. On the other hand, strong board governance provides effective oversight over compensation policies to strengthen the link between equity incentives and firm performance which may suggest a complementary relationship between board governance and equity incentives. I test this conjecture by examining the interaction effects of board governance and equity incentives on the likelihood and frequency of earnings guidance. In particular, I use an indicator which equals one if equity incentives are in the top quintile (EQ) and interact with the other three board governance variables.

As observed from Table 7, the main effects of the board governance and equity incentives variables are relatively similar to Table 3. However, the interaction between board independence (BD_IND) and EQ is significantly negative in both regressions. This indicates that for firms with equity incentives in the highest quintile (EQ=1), the influence of board independence on the propensity and frequency of earnings guidance is *lower*, suggesting a substitutive relationship between board independence and equity incentives. From an efficient contracting perspective, this suggests that firms trade-off low effectiveness of board independence (presumably because of lower technical expertise of outside directors) with higher equity incentives to influence forecasting activities. On the other hand, the interaction between board meeting frequency (NUMMTGS) and EQ is significantly positive in both regressions, suggesting a complementary relationship. This suggests that when equity incentives are high, managers are more motivated to ensure the productivity of board meetings and hence results in their greater influence on

forecasting activities[28]. Overall, the evidence suggests that board governance and equity incentives likely play an interactive role in influencing corporate disclosure decisions.

6.2 Selection Bias

For my investigation of forecast characteristics, it can be reasonably expected that firms first determine whether to provide an earnings forecast, and then later choose the forecast quality. This leads to potential selection problem as firms that do not issue forecasts are not included in this sample. To mitigate sample selection problem, I use Heckman two-step estimator for all my estimation where forecast quality is the explained variable for robustness checks. In untabulated estimations, all results for EQ_INCENT are qualitatively similar statistically, except that NUMMTGS is no longer significant in the FC_ACC regression. Also, the inverse Mills' Ratio is only significant in the FC_ACC regression, suggesting that sample selection problem is unlikely to be material in the overall analyses. In sum, the tenor of the main results is consistent after controlling for selection bias.

6.3 Alternative Measures of Forecast Quality

In my main analyses, I define forecast accuracy as the negative absolute difference between actual earnings and management earnings forecast. For additional analysis, I define *relative* forecast accuracy as the mean consensus analysts' forecast error less management forecast error such that this measure is increasing if management forecast is *relatively more* accurate than analysts' forecast, and I re-run my analysis using this measure as the dependent variable. In

[28] As highlighted by Jensen (1993), managers usually set the agenda for board meetings and choose which information to reveal to the board, hence managers are likely to play an important role in the productivity of board meetings.

untabulated analysis, none of the internal governance variables is statistically significant. This result could be due to the fact that firms in my sample have relatively large analyst following, and hence it may be more difficult for internal governance to influence forecasts that are more accurate than the consensus mean on average.

In addition, I follow Baginski and Hassell (1997) and define forecast specificity using a point measure and assign 0 for qualitative forecasts, 1 for open-ended forecasts, 2 for range forecasts and 3 for point forecasts and re-run my analysis using an ordered probit model. Untabulated results indicate that none of the internal governance variables is statistically significant, suggesting that my result regarding forecast specificity is only applicable where firms issue point or range forecasts. Given that 91.5% of my sample are either point or range forecasts (untabulated), I do not think this finding affects the generalizability of my results substantially.

7. Summary and Conclusion

This paper investigates the role of management earnings forecasts in mitigating information asymmetry between investors and managers relating to moral hazard, and explains how earnings guidance facilitates monitoring. I demonstrate that firms that are more susceptible to moral hazard problems and more difficult to monitor are also more likely to issue annual earnings forecasts and they do so more frequently. In addition, I examine how firm internal governance drives forecasting decisions and show that stronger board governance and managerial equity incentives are associated with higher likelihood and frequency of forecasts provision. Finally, I provide robust evidence that managerial equity incentives are associated with more informative and higher quality guidance. In particular, I find that these forecasts are more accurate, unbiased, more specific and timely, consistent with equity incentives aligning shareholders' and managers'

interests regarding disclosure decisions. However, I find mixed evidence on the association between board governance and forecast quality.

Despite not possessing the same qualitative characteristics as mandatory financial accounting information, results in this paper suggest that management earnings guidance is likely to remain an important component of corporate disclosure practice and overall firm financial reporting systems given its information role as a monitoring mechanism. In addition, this paper highlights how various internal governance mechanisms work together to influence forecasting activities, and suggests that firms trade-off the effectiveness of each mechanism to reduce overall agency costs. Future research can build on this paper's findings and corroborate the usefulness of earnings forecasts by examining the economic consequences associated with forecast provision. Also, even though I demonstrate that managerial equity incentives are associated with higher quality earnings guidance, I do not provide evidence indicating whether forecasts associated with higher equity incentives are value-increasing. Aboody and Kasznik (2000) find that managers opportunistically time their disclosure to increase the value of their fixed-date options grants, which presumably is value-decreasing. Future research can amalgamate these seemingly inconsistent findings and provide direct evidence indicating if forecasts associated with higher equity incentives are value-increasing.

APPENDIX A

Variables Definition

Forecast variables

FORECAST Indicator equals 1 if the firm issues an annual earnings forecast during the fiscal year and zero otherwise.

FC_FREQ The number of annual earnings forecasts issued by the firm during the fiscal year.

FC_ACC Forecast accuracy, which is defined as the negative absolute value of the actual earnings less management earnings forecast, scaled by stock price at the beginning of the fiscal year. This measure is increasing in management forecast accuracy.

FC_BIAS Forecast bias, defined as the actual earnings less management earnings forecast, scaled by stock price at the beginning of the fiscal year. This measure is increasing in forecast optimism.

FC_SPEC Forecast specificity, which is defined as the negative value of the earnings forecast spread, scaled by stock price at the beginning of the fiscal year. This measure is zero for point forecasts, increasing in specificity, and is defined only for range and point forecasts.

FC_HORIZ Forecast horizon, defined as the number of days between the management forecast and the fiscal-year end, and is increasing in the timeliness of the forecast.

FC_MEAN Management earnings forecast less the prevailing consensus mean analysts' earnings forecast, scaled by stock price at the beginning of the fiscal year.

CAR 3-day cumulative abnormal returns surrounding the management earnings forecast date.

Incentives variable

EQ_INCENT Natural logarithm of the sensitivity of CEO's equity portfolio dollar value to 1% change in stock price, similar to Core and Guay (1999, 2002).

Board governance variables

BD_IND Percentage of independent directors on the board.

BD_SIZE Number of board directors.

NUMMTGS Number of board meetings.

Moral hazard variables

INSIDEOWN Percentage shareholdings held by the top five executives in the firm.

LN(SALES) Natural logarithm of sales, proxies for firm size.

$(LN(SALES))^2$ Squared term of LN(SALES), to allow for non-linearity in the relationship.

PPE Capital intensity, measured as net property plant and equipment scaled by sales, represents the "hard assets" in the firm.

PPE^2 Squared term of PPE, to allow for non-linearity in the relationship.

IRISK Idiosyncratic risk, measured as the standard deviation of the residual in the market model regression, estimated using daily returns over the fiscal year.

OM Operating profit margin.

R&D Research and development intensity, measured as research and development expenses scaled by total assets.

ADVERT Advertising intensity, measured as advertising expenses scaled by total assets.

INVEST Investment intensity, measured as capital expenditure scaled by total assets.

BM Book value of equity divided by the market value of equity.

LEVERAGE Long term debt, scaled by total assets.

FORSALE Percentage of foreign sales.

LN(SEG) Natural logarithm of the number of business segments.

GEO_HERF Firm's geographical sales concentration, measured as the Herfindahl index of the geographical segment sales.

IND_HERF Firm's industry sales concentration, measured as the Herfindahl index of the two digit SIC industry segment sales.

Control variables

ADJINSTM Measure of adverse selection according to Ali, Klasa and Li (2008), defined as $ADJINSTM = \frac{Shares\ held\ by\ medium\ institutional\ investors}{Shares\ outstanding - shares\ held\ by\ large\ institutional\ investors}$. Firms may provide earnings forecasts to mitigate adverse selection problems.

IOCONCENT Herfindahl index of institutional shareholdings. High institutional ownership concentration may represent lower informational demand, since individual large stakeholders have both the incentives and ability to monitor managers directly through direct communications with management.

LITIG Indicator equals 1 if the firm is in the following high litigation risk industries: biotechnology (SIC 2833-2836); computer hardware (SIC 3570-3577); electronics (SIC 3600-3674); retail (SIC 3500-5961) and computer software (SIC 7371-7379) and zero otherwise, according to Francis, Philbrick and Schipper (1994).

EARNVOL Volatility of earnings before extraordinary items scaled by mean market value of equity in the prior 3 years. High volatility of earnings may indicate difficulty of forecasting for financial analysts and managers alike.

ANNRET Stock returns over the fiscal year, to control for firms which are more likely to provide earnings forecasts when they have been performing well (Miller (2002)).

LOSS Indicator equals one if the firm report losses in the current fiscal year and zero otherwise. Loss-making firms are less likely to issue forecasts since the future is less uncertain. On the other hand, loss-making companies may be more willing to provide forecasts to mitigate litigation risks (Skinner (1994)).

NUMEST Number of analysts following the firm.

TABLE 1

Sample and Descriptive Statistics

Panel A: Sample by Year

Year	OBS	FORECAST Mean	FC_FREQ OBS	FC_FREQ Mean
1995	841	12.84%	108	1.20
1996	1,098	16.21%	178	1.38
1997	1,175	24.34%	286	1.67
1998	1,169	32.68%	382	1.95
1999	1,178	36.42%	429	1.99
2000	1,251	50.76%	635	2.75
2001	1,235	51.17%	632	3.70
2002	1,227	52.73%	647	4.04
2003	1,220	54.43%	664	4.23
2004	1,180	52.37%	618	4.48
2005	1,182	53.72%	635	4.65

Panel B: Sample by Main Industries

Industry	OBS	FORECAST Mean	FC_FREQ OBS	FC_FREQ Mean
Food	435	51.95%	226	3.90
Mining and Minerals	137	21.90%	30	3.00
Oil and Petroleum Products	490	14.49%	71	2.52
Textiles, Apparel & Footwear	288	47.22%	136	4.09
Consumer Durables	297	46.13%	137	3.64
Chemicals	363	36.36%	132	2.58
Drugs, Soap, Perfumes, Tobacco	462	58.01%	268	3.97
Construction and Construction Materials	456	44.08%	201	3.40
Steel Works	247	16.19%	40	2.10
Fabricated Products	126	47.62%	60	3.23
Machinery and Business Equipment	1,764	30.95%	546	3.18
Automobiles	291	35.40%	103	2.83
Transportation	546	32.97%	180	3.63
Utilities	830	52.29%	434	4.20
Retail Stores	1,020	52.06%	531	3.64
Banks, Insurance Companies, and Other Financials	1,495	31.44%	470	2.94
Other	3,509	46.99%	1,649	3.21

Panel C: Descriptive Statistics

Variables	Obs.	Mean	Std.Dev.	Q1	Median	Q3
FORECAST	12,756	0.41	0.49	0.00	0.00	1.00
FC_FREQ	5,214	3.39	2.35	1.00	3.00	5.00
FC_ACC	15,627	-0.0057	0.0083	-0.0068	-0.0025	-0.0008
FC_BIAS	15,627	0.0007	0.0100	-0.0025	-0.0004	0.0023
FC_SPEC	16,110	-0.0029	0.0036	-0.0038	-0.0020	-0.0007
FC_HORIZ	17,681	223.38	131.58	115.00	236.00	323.00
Equity Incentives						
EQ_INCENT	12,756	12.46	1.86	11.52	12.50	13.51
Board Governance						
BD_IND	12,756	0.66	0.17	0.56	0.67	0.80
BD_SIZE	12,756	9.64	2.89	8.00	9.00	11.00
NUMMTGS	12,756	7.29	3.07	5.00	7.00	9.00

Moral Hazard						
INSIDEOWN	12,756	0.06	0.09	0.02	0.04	0.07
LN(SALES)	12,756	7.33	1.49	6.31	7.21	8.31
$(LN(Sales))^2$	12,756	55.92	22.42	39.82	52.05	69.11
PPE	12,756	0.45	0.81	0.12	0.22	0.45
PPE^2	12,756	0.87	23.48	0.01	0.05	0.20
IRISK	12,756	0.02	0.01	0.02	0.02	0.03
OM	12,756	0.15	1.60	0.10	0.16	0.25
R&D	6,768	0.05	0.07	0.01	0.03	0.07
ADVERT	3,487	0.04	0.06	0.01	0.02	0.05
INVEST	11,852	0.06	0.06	0.03	0.05	0.08
BM	12,756	0.49	0.42	0.26	0.42	0.62
LEVERAGE	12,756	0.23	0.18	0.08	0.22	0.34
FORSALE	10,749	0.21	0.23	0.00	0.15	0.38
LN(SEG)	11,183	1.14	0.45	0.69	1.10	1.61
GEO_HERF	10,736	0.73	0.26	0.50	0.75	1.00
IND_HERF	11,173	0.87	0.21	0.77	1.00	1.00
Firm Controls						
ADJINSTM	12,756	0.34	0.15	0.23	0.33	0.43
IOCONCENT	12,756	0.02	0.03	0.01	0.02	0.03
LITIG	12,756	0.26	0.44	0.00	0.00	1.00
EARNVOL	12,756	0.04	0.10	0.01	0.02	0.04
ANNRET	12,756	0.19	0.41	-0.03	0.18	0.39
LOSS	12,756	0.16	0.36	0.00	0.00	0.00
NUMEST	12,756	8.71	6.16	4.00	7.00	12.00

The sample consists of 12,756 firm-year observations from 1995 to 2005. FORECAST equals one if the firm provides an annual earnings forecast during the fiscal year, zero otherwise. FC_FREQ is the number of annual earnings forecasts made during the fiscal year. FC_ACC is the negative absolute value of the actual earnings less management earnings forecast, scaled by stock price at the beginning of the fiscal year. FC_BIAS is management earnings forecast less actual earnings, scaled by stock price at the beginning of the fiscal year. FC_SPEC is the negative value of the earnings forecast spread, scaled by stock price at the beginning of the fiscal year. FC_HORIZ is the number of days between the management earnings forecast date and the fiscal year end. EQ_INCENT is the natural logarithm of sensitivity of CEO's equity portfolio dollar value to 1% change in stock price. BD_IND is the percentage of independent directors on the board. BD_SIZE is the number of board directors. NUMMTGS is the number of board meetings. INSIDEOWN is the percentage shareholdings held by the top five executives in the firm. LN(SALES) is the logarithm of sales. PPE is the net property, plant and equipment, scaled by sales. IRISK is the idiosyncratic risk, measured as the standard deviation of the residual in the market model regression. OM is the operating profit margin. R&D is research and development expenses, scaled by total assets. ADVERT is advertising expenses, scaled by total assets. INVEST is capital expenditure scaled by total assets. BM is the book to market ratio. LEVERAGE is the long term debt, scaled by total assets. FORSALE is the percentage of foreign sales. LN(SEG) is the natural logarithm of the number of business segments. GEO_HERF is the firm's geographical sales concentration. IND_HERF is the firm's industry sales concentration. ADJINSTM is the empirical proxy for adverse selection according to Ali, Klasa and Li (2008). IOCONCENT is the Herfindahl index of institutional shareholdings. LITIG equals one if the firm belongs to the high litigation risk industries according to Francis, Philbrick and Schipper (1994), zero otherwise. EARNVOL is the volatility of earnings, scaled by mean market value of equity in the prior three years. ANNRET is stock returns over the fiscal year. LOSS equals one if the firm report losses in the current fiscal year, zero otherwise. NUMEST is the number of analysts following the firm.

TABLE 2

Pearson Correlation Table

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	FORECAST	1.00																			
2	FC_FREQ		1.00																		
3	EQ_INCENT	0.11	0.10	1.00																	
4	BD_IND	0.13	0.17	-0.07	1.00																
5	BD_SIZE	0.07	0.03	0.09	0.09	1.00															
6	NUMMTGS	0.05	0.06	-0.07	0.15	0.09	1.00														
7	INSIDEOWN	-0.08	-0.09	0.29	-0.29	-0.25	-0.16	1.00													
8	LN(SALES)	0.21	0.21	0.32	0.16	0.48	0.12	-0.26	1.00												
9	PPE	-0.08	0.03	-0.11	0.02	0.03	0.06	-0.07	-0.10	1.00											
10	IRISK	-0.09	-0.19	-0.08	-0.15	-0.39	0.03	0.17	-0.39	-0.04	1.00										
11	OM	0.02	0.01	0.02	0.00	0.04	0.02	-0.04	0.11	-0.58	-0.10	1.00									
12	R&D	-0.07	-0.04	0.02	0.02	-0.24	0.03	0.00	-0.29	-0.04	0.37	-0.14	1.00								
13	ADVERT	0.06	0.04	0.06	-0.04	-0.01	-0.03	0.07	0.06	-0.06	0.01	-0.05	-0.03	1.00							
14	INVEST	-0.08	-0.03	0.00	-0.11	-0.14	-0.07	0.06	-0.08	0.30	0.11	0.01	-0.02	0.03	1.00						
15	BM	-0.08	-0.05	-0.31	-0.01	-0.03	0.04	0.02	-0.03	0.07	0.13	0.00	-0.16	-0.07	-0.08	1.00					
16	LEVERAGE	0.04	0.04	-0.08	0.05	0.16	0.12	-0.13	0.21	0.25	-0.10	0.01	-0.21	-0.07	0.05	0.09	1.00				
17	FORSALE	-0.01	-0.01	0.08	0.09	-0.10	0.00	-0.08	0.04	-0.05	0.11	-0.02	0.30	-0.01	-0.03	-0.10	-0.09	1.00			
18	LN(SEG)	0.07	0.05	-0.04	0.10	-0.03	0.02	-0.08	0.16	0.02	-0.04	0.00	-0.01	-0.07	0.01	0.06	0.08	0.14	1.00		
19	GEO_HERF	-0.06	-0.06	-0.13	-0.13	-0.16	-0.06	0.07	-0.07	0.11	0.04	-0.03	-0.07	0.03	0.22	0.05	0.06	-0.30	0.22	1.00	
20	IND_HERF	-0.07	-0.11	-0.08	-0.14	-0.35	-0.11	0.09	-0.20	0.05	0.23	-0.03	0.19	0.01	0.22	-0.01	-0.09	0.12	0.30	0.39	1.00

The sample consists of 12,756 firm-year observations from 1995 to 2005. FORECAST equals one if the firm provides an annual earnings forecast during the fiscal year, zero otherwise. FC_FREQ is the number of annual earnings forecasts made during the fiscal year. FC_ACC is the negative absolute value of the actual earnings less management earnings forecast, scaled by stock price at the beginning of the fiscal year. FC_BIAS is management earnings forecast less actual earnings, scaled by stock price at the beginning of the fiscal year. FC_SPEC is the negative value of the earnings forecast spread, scaled by stock price at the beginning of the fiscal year. FC_HORIZ is the number of days between the management earnings forecast date and the fiscal year end. EQ_INCENT is the natural logarithm of sensitivity of CEO's equity portfolio dollar value to 1% change in stock price. BD_IND is the percentage of independent directors on the board. BD_SIZE is the number of board directors. NUMMTGS is the number of board meetings. INSIDEOWN is the percentage shareholdings held by the top five executives in the firm. LN(SALES) is the logarithm of sales. PPE is the net property, plant and equipment, scaled by sales. IRISK is the idiosyncratic risk, measured as the standard deviation of the residual in the market model regression. OM is the operating profit margin. R&D is research and development expenses, scaled by total assets. ADVERT is advertising expenses, scaled by total assets. INVEST is capital expenditure scaled by total assets. BM is the book to market ratio. LEVERAGE is the long term debt, scaled by total assets. FORSALE is the percentage of foreign sales. LN(SEG) is the natural logarithm of the number of business segments. GEO_HERF is the firm's geographical sales concentration. IND_HERF is the firm's industry sales concentration. All correlations are statistically significant at 0.05 level or better, except those highlighted.

TABLE 3

Determinants of the Likelihood of Providing Annual Earnings Forecast and the Frequency of Annual Earnings Forecasts

$$\Pr(FORECAST_{t+1}) = \alpha_0 + \beta_i(\text{Equity Incentives})_t + \sum\varphi_i(\text{Board Governance})_t + \sum\gamma_i(\text{Moral Hazard})_t + \sum\phi_i(\text{Controls})_t + \varepsilon_t$$

$$FC\_FREQ_{t+1} = \alpha_0 + \beta_i(\text{Equity Incentives})_t + \sum\varphi_i(\text{Board Governance})_t + \sum\gamma_i(\text{Moral Hazard})_t + \sum\phi_i(\text{Controls})_t + \varepsilon_t$$

	FORECAST				**FC_FREQ**				**FC_FREQ**			
	Probit				**OLS**				**Heckman**			
	Pred.	*Coef.*	*z-stats*		Pred.	*Coef.*	*t-stats*		Pred.	*Coef.*	*t-stats*	
Equity Incentives												
EQ_INCENT	+	0.018	1.70	*	+	0.018	0.56		+	0.059	1.73	*
Board Governance												
BD_IND	+	0.063	0.51		+	0.124	0.67		+	0.287	1.59	
BD_SIZE	+	0.018	2.24	**	+	-0.014	-0.83		+	0.025	1.14	
NUMMTGS	+	0.011	1.90	*	+	0.020	1.77	*	+	0.042	3.00	***
Moral Hazard												
INSIDEOWN	-	-0.910	-3.38	***	-	-1.231	-2.41	**	-	-3.244	-4.08	***
LN(SALES)	+	0.428	3.80	***	+	0.130	0.50		+	1.219	3.18	***
$(LN(SALES))^2$	+/-	-0.020	-2.72	***	+/-	0.008	0.46		+/-	-0.045	-2.06	**
PPE	-	-0.264	-3.62	***	-	-0.595	-2.78	***	-	-1.187	-3.71	***
PPE^2	+/-	0.014	1.90	*	+/-	0.123	3.23	***	+/-	0.156	3.31	***
IRISK	+	-1.155	-0.48		+	10.123	2.00	**	+	8.352	1.62	
OM	+	0.198	1.31		+	0.419	1.85	*	+	0.847	3.11	***
R&D	+/-	-1.517	-2.81	***	+/-	0.584	0.45		+/-	-3.061	-1.85	*
ADVERT	+/-	-0.268	-0.53		+/-	0.715	0.74		+/-	0.082	0.08	
INVEST	+	0.467	1.01		+	2.986	2.79	***	+	3.856	3.31	***
BM	-	-0.188	-2.21	**	-	-0.028	-0.21		-	-0.438	-3.08	***
LEVERAGE	+	0.210	1.77	*	+	0.765	3.20	***	+	1.157	4.43	***
FORSALE	+	-0.348	-1.27		+	-1.509	-3.15	***	+	-2.378	-4.71	***
LN(SEG)	+	0.124	2.15	**	+	0.076	0.57		+	0.323	2.28	**
GEO_HERF	-	-0.131	-0.54		-	-1.360	-3.01	***	-	-1.794	-3.93	***
IND_HERF	-	0.033	0.22		-	-0.502	-2.03	**	-	-0.444	-1.75	*
Firm Controls												
ADJINSTM		0.841	5.99	***		0.547	2.15	**		2.428	4.31	***
IOCONCENT		-1.883	-2.40	**		-3.833	-2.24	**		-8.046	-4.38	***
LITIG		-0.219	-1.85	*		-0.451	-2.26	**		-0.902	-4.10	***
EARNVOL		-0.677	-0.85			-0.147	-0.32			-2.338	-3.50	***
ANNRET		0.004	0.06			0.261	3.31	***		0.300	3.48	***
LOSS		-0.175	-3.27	***		-0.333	-2.78	***		-0.710	-4.74	***
NUMEST		0.004	0.77			0.014	1.95	*		0.022	2.70	***
MILL'S RATIO										3.561	3.83	***
INTERCEPT		-2.746	-5.20	***		0.968	0.60			-8.810	-2.94	***
48 Industries												
Fixed Effects		Yes				Yes				Yes		
Year Fixed Effects		Yes				Yes				Yes		
Observations		12,755				5,214				5,213		
Pseudo R^2/Adj. R^2		19.73%				34.29%				34.74%		

All variables are defined in Appendix A. Indicator variables for observations with missing variables have been omitted for brevity. Standard errors are corrected for cross-sectional and time-series dependence. ***, **, and * indicate statistical significance at the 0.01, 0.05 and 0.10 level or better, respectively (two-tailed test).

TABLE 4

Determinants of the Frequency of Annual Earnings Forecasts, conditional on forecast news

$$NEWS\_FREQ_{t+1} = \alpha_0 + \beta_i(\text{Equity Incentives})_t + \sum\varphi_i(\text{Board Governance})_t + \sum\gamma_i(\text{Moral Hazard})_t + \sum\phi_i(\text{Controls})_t + \varepsilon_t$$

	GDNEWS_FREQ				BDNEWS_FREQ			
		Heckman				Heckman		
	Pred.	*Coef.*	*t-stats*		Pred.	*Coef.*	*t-stats*	
Equity Incentives								
EQ_INCENT	+	0.046	2.66	***	+	0.014	0.61	
Board Governance								
BD_IND	+	0.163	1.54		+	0.117	0.98	
BD_SIZE	+	0.014	1.03		+	0.009	0.76	
NUMMTGS	+	0.021	2.01	**	+	0.019	2.94	***
Moral Hazard								
INSIDEOWN	-	-2.049	-3.79	***	-	-1.198	-3.05	***
LN(SALES)	+	0.870	2.83	***	+	0.339	1.44	
$(LN(SALES))^2$	+/-	-0.035	-2.04	**	+/-	-0.009	-0.71	
PPE	-	-0.695	-3.27	***	-	-0.473	-2.43	***
PPE^2	+/-	0.083	1.98	**	+/-	0.071	2.89	***
IRISK	+	7.167	1.94	*	+	1.861	0.74	
OM	+	0.467	2.53	**	+	0.387	2.91	***
R&D	+/-	-1.889	-2.13	**	+/-	-1.157	-1.02	
ADVERT	+/-	0.200	0.29		+/-	-0.049	-0.11	
INVEST	+	2.127	3.66	***	+	1.780	2.23	**
BM	-	-0.182	-1.51		-	-0.251	-3.44	***
LEVERAGE	+	0.871	4.56	***	+	0.263	1.47	
FORSALE	+	-1.199	-3.62	***	+	-1.156	-3.44	***
LN(SEG)	+	0.270	2.22	**	+	0.055	1.06	
GEO_HERF	-	-0.837	-2.75	***	-	-0.943	-2.62	***
IND_HERF	-	-0.075	-0.49		-	-0.356	-2.78	***
Firm Controls								
ADJINSTM		1.467	3.67	***		0.924	3.22	***
IOCONCENT		-5.714	-5.20	***		-2.143	-1.73	*
LITIG		-0.489	-4.22	***		-0.386	-2.28	**
EARNVOL		-1.688	-4.55	***		-0.626	-1.52	
ANNRET		0.334	3.76	***		-0.046	-0.89	
LOSS		-0.702	-4.90	***		-0.008	-0.15	
NUMEST		0.015	2.33	**		0.006	1.13	
MILL'S RATIO		2.407	3.66	***		1.098	1.99	**
INTERCEPT		-7.222	-3.11	***		-1.504	-0.79	
48 Industries Fixed Effects		Yes				Yes		
Year Fixed Effects		Yes				Yes		
Observations		5,213				5,213		
Adjusted R^2		24.21%				21.07%		

NEWS_FREQ refers to either GDNEWS_FREQ or BDNEWS_FREQ in this table. GDNEWS_FREQ (BDNEWS_FREQ) is the number of good (bad) news annual earnings forecasts made during the fiscal year, where good (bad) news are defined as forecasts where the 3-day cumulative abnormal returns are positive (negative). All other variables are defined in Appendix A. Indicator variables for observations with missing variables have been omitted for brevity. Standard errors are corrected for cross-sectional and time-series dependence. ***, **, and * indicate statistical significance at the 0.01, 0.05 and 0.10 level or better, respectively (two-tailed test).

TABLE 5

Determinants of the Forecast Accuracy and Forecast Bias

$$FC\_QUAL_{t+1} = \alpha_0 + \beta_i(\text{Equity Incentives})_t + \sum\varphi_i(\text{Board Governance})_t + \sum\gamma_i(\text{Moral Hazard})_t + \sum\phi_i(\text{Controls})_t + \varepsilon_t$$

	FC_ACC				FC_BIAS			
	OLS				OLS			
	Pred.	*Coef.*	*t-stats*		Pred.	*Coef.*	*t-stats*	
Incentives								
EQ_INCENT	+	0.030	3.34	***	/	0.006	0.39	
Board Governance								
BD_IND	+	-0.198	-4.14	***	/	-0.022	-0.31	
BD_SIZE	+	0.003	0.33		/	0.002	0.24	
NUMMTGS	+	0.004	1.69	*	/	0.007	1.44	
Moral Hazard								
INSIDEOWN		-0.527	-2.79	***		0.115	0.44	
LN(SALES)		-0.159	-1.69	*		-0.177	-1.65	*
$(LN(SALES))^2$		0.009	1.44			0.011	1.60	
PPE		0.017	0.18			0.030	0.25	
PPE^2		-0.006	-0.38			-0.001	-0.04	
IRISK		-10.886	-5.32	***		-0.862	-0.24	
OM		0.059	0.32			0.144	0.57	
R&D		-0.489	-1.39			0.838	1.32	
ADVERT		0.339	0.85			-0.171	-0.27	
INVEST		-0.107	-0.27			0.242	0.51	
BM		-0.377	-3.92	***		-0.021	-0.18	
LEVERAGE		-0.209	-2.87	***		0.041	0.24	
FORSALE		-0.090	-0.77			0.187	0.99	
LN(SEG)		0.030	0.98			-0.002	-0.03	
GEO_HERF		-0.197	-2.08	**		0.097	0.66	
IND_HERF		0.073	0.82			0.121	0.96	
Firm Controls								
ADJINSTM		-0.063	-0.79			-0.023	-0.11	
IOCONCENT		-0.939	-1.39			0.727	0.74	
LITIG		-0.016	-0.27			-0.019	-0.30	
EARNVOL		-0.594	-1.34			-0.825	-1.39	
ANNRET		0.131	2.98	***		-0.310	-3.69	***
LOSS		-0.410	-7.14	***		0.637	5.88	***
NUMEST		0.002	0.52			-0.004	-1.15	
Forecast Controls								
FC_HORIZ		-0.002	-11.12	***		0.001	2.04	**
FC_SPEC		0.312	5.66	***		-0.171	-3.23	***
FC_MEAN		0.068	2.58	***		0.038	1.01	
INTERCEPT		0.138	0.34			-0.273	-0.46	
48 Industries Fixed Effects		Yes				Yes		
Year Fixed Effects		Yes				Yes		
Observations		15,627				15,627		
Adjusted R^2		25.33%				10.91%		

FC_QUAL refers to either FC_ACC or FC_BIAS in this table. FC_ACC and FC_BIAS are multiplied by 100 to assist presentation. All other variables are defined in Appendix A. Indicator variables for observations with missing variables have been omitted for brevity. Standard errors are corrected for cross-sectional and time-series dependence. ***, **, and * indicate statistical significance at the 0.01, 0.05 and 0.10 level or better, respectively (two-tailed test).

TABLE 6

Determinants of the Forecast Specificity and Forecast Horizon

$$FC\_QUAL_{t+1} = \alpha_0 + \beta_i(\text{Equity Incentives})_t + \sum\varphi_i(\text{Board Governance})_t + \sum\gamma_i(\text{Moral Hazard})_t + \sum\phi_i(\text{Controls})_t + \varepsilon_t$$

	FC_SPEC				FC_HORIZ			
		OLS				OLS		
	Pred.	*Coef.*	*t-stats*		Pred.	*Coef.*	*t-stats*	
Incentives								
EQ_INCENT	+	0.012	2.10	**	+	3.693	2.46	**
Board Governance								
BD_IND	+	-0.050	-1.08		+	-9.862	-1.03	
BD_SIZE	+	-0.002	-0.41		+	-1.129	-1.91	*
NUMMTGS	+	-0.001	-0.58		+	0.221	0.60	
Moral Hazard								
INSIDEOWN		-0.130	-1.04			-20.587	-1.25	
LN(SALES)		0.025	0.94			-6.703	-0.88	
$(LN(SALES))^2$		-0.002	-1.44			0.554	1.41	
PPE		0.025	0.63			-13.601	-1.31	
PPE^2		0.001	0.12			2.651	1.80	*
IRISK		-5.436	-5.94	***		1072.724	4.08	***
OM		0.038	0.54			36.181	2.38	**
R&D		-0.357	-2.32	**		17.061	0.31	
ADVERT		-0.052	-0.41			-90.806	-2.10	**
INVEST		-0.265	-1.74	*		48.812	1.57	
BM		-0.333	-6.17	***		-9.226	-1.57	
LEVERAGE		-0.126	-2.28	**		25.204	2.35	**
FORSALE		0.006	0.08			2.461	0.27	
LN(SEG)		-0.020	-1.36			2.001	0.37	
GEO_HERF		0.050	0.66			-7.977	-2.04	**
IND_HERF		-0.027	-0.92			-0.774	-0.07	
Firm Controls								
ADJINSTM		0.050	0.86			26.136	2.48	**
IOCONCENT		0.373	1.05			-139.284	-2.41	**
LITIG		-0.012	-0.50			-0.412	-0.07	
EARNVOL		-0.066	-0.24			66.185	3.65	***
ANNRET		0.077	3.22	***		-14.001	-3.17	***
LOSS		-0.069	-2.69	***		19.402	5.64	***
NUMEST		0.005	4.20	***		0.088	0.24	
Forecast Controls								
FC_HORIZ		-0.000	-9.13	***				
FC_MEAN		0.005	0.89					
CAR						61.041	3.24	***
INTERCEPT		-0.062	-0.37			134.368	3.55	***
48 Industries Fixed Effects		Yes				Yes		
Year Fixed Effects		Yes				Yes		
Observations		16,110				17,681		
Adjusted R^2		28.04%				3.36%		

FC_QUAL refers to either FC_SPEC or FC_HORIZ in this table. FC_SPEC is multiplied by 100 to assist presentation. All other variables are defined in Appendix A. Indicator variables for observations with missing variables have been omitted for brevity. Standard errors are corrected for cross-sectional and time-series dependence. ***, **, and * indicate statistical significance at the 0.01, 0.05 and 0.10 level or better, respectively (two-tailed test).

TABLE 7

Determinants of the Likelihood of Providing Annual Earnings Forecast and the Frequency of Annual Earnings Forecasts Including Interactions among Governance Mechanisms

	FORECAST				FC_FREQ			
	Probit				Heckman			
	Pred.	*Coef.*	*z-stats*		Pred.	*Coef.*	*z-stats*	
Equity Incentives								
EQ_INCENT	+	0.026	2.21	**	+	0.072	2.08	**
Board Governance								
BD_IND	+	0.166	1.22		+	0.481	2.45	**
BD_SIZE	+	0.017	2.21	**	+	0.028	1.24	
NUMMTGS	+	0.005	0.91		+	0.024	2.57	***
Interaction								
BD_IND*EQ		-0.546	-2.89	***		-0.969	-2.01	**
BD_SIZE*EQ		0.001	0.09			-0.011	-0.55	
NUMMTGS*EQ		0.031	3.00	***		0.077	2.66	***
Moral Hazard								
INSIDEOWN	-	-0.795	-3.06	***	-	-3.090	-4.00	***
LN(SALES)	+	0.415	3.63	***	+	1.165	3.08	***
$(LN(SALES))^2$	+/-	-0.019	-2.52	**	+/-	-0.041	-1.90	*
PPE	-	-0.269	-3.61	***	-	-1.191	-3.70	***
PPE^2	+/-	0.015	1.98	**	+/-	0.157	3.27	***
IRISK	+	-1.068	-0.45		+	8.521	1.63	
OM	+	0.220	1.42		+	0.879	3.12	
R&D	+/-	-1.479	-2.76	***	+/-	-2.923	-1.80	*
ADVERT	+/-	-0.298	-0.58		+/-	0.043	0.04	
INVEST	+	0.446	0.96		+	3.798	3.28	***
BM	-	-0.191	-2.21	**	-	-0.429	-3.05	***
LEVERAGE	+	0.200	1.71	*	+	1.131	4.30	***
FORSALE	+	-0.352	-1.28		+	-2.382	-4.73	***
LN(SEG)	+	0.120	2.09	**	+	0.313	2.17	**
GEO_HERF	-	-0.134	-0.55		-	-1.808	-3.95	***
IND_HERF	-	0.033	0.21		-	-0.449	-1.77	**
Firm Controls								
ADJINSTM		0.819	5.82	***		2.381	4.27	***
IOCONCENT		-1.832	-2.35	**		-7.898	-4.47	***
LITIG		-0.218	-1.84	*		-0.900	-4.10	***
EARNVOL		-0.677	-0.85			-2.302	-3.43	***
ANNRET		0.004	0.07			0.297	3.46	***
LOSS		-0.176	-3.29	***		-0.708	-4.89	***
NUMEST		0.005	0.99			0.024	2.75	***
MILL'S RATIO						3.526	3.78	***
INTERCEPT		-2.801	-5.48	***		-8.706	-2.85	***
48 Industries Fixed Effects		Yes				Yes		
Year Fixed Effects		Yes				Yes		
Observations		12,755				5,213		
Pseudo R^2/Adj. R^2		19.86%				34.77%		

All variables are defined in Appendix A. The regression models in this table are similar to that in Table 3, except that interaction variables between EQ and board governance variables are included. EQ is an indicator equals one where EQ_INCENT is in the top quintile, and zero otherwise. Indicator variables for observations with missing variables have been omitted for brevity. Standard errors are corrected for cross-sectional and time-series dependence. ***, **, and * indicate statistical significance at the 0.01, 0.05 and 0.10 level or better, respectively (two-tailed test).

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